










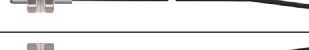








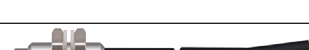




Fiber Optic Cable

Specifications (Diffuse Reflective Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L)	Temp.
Flexible type ^{※4}		Flat type /Top view	FDFU-210-05R	35 ^{※1}	Ø0.0125	R1	1m Free cut	-40 to 60°C
		Flat type /Side view	FDFN-210-05R	30 ^{※1}				
		Flat type /Flat view	FDF-210-05R					
		M3 Bolt	FD-320-05R	35 ^{※1}	Ø0.0125			
		M4 Bolt	FD-420-05R					
		M6 Bolt	FD-620-10R	130 ^{※1}	Ø0.04			
Break-resistant type ^{※4}		M3 Bolt	FD-320-06B	35 ^{※2}	Ø0.0125	R5	2m Free cut	-40 to 60°C
		Ø3 Cylinder type	FDC-320-06B					
		M4 Bolt	FD-420-06B					
		M6 Bolt	FD-620-13B	100 ^{※2}				
Standard type		M3 Bolt	FD-310-05	40 ^{※2}	Ø0.03	R15	1m Free cut	-40 to 70°C
		M3 Bolt	FD-320-05	40 ^{※2}				
		M4 Bolt	FD-420-05					
		Ø3 Cylinder type	FDC-320-05					
		Ø3 Cylinder type SUS type (15mm)	FDCS-320-05	40 ^{※2}	Ø0.03	15R (SUS part 10R)	2m Free cut	
		M3 Bolt SUS type (90mm)	FDS-320-05					
		M3 Bolt SUS type (45mm)	FDS2-320-05					
		M4 Bolt SUS type (90mm)	FDS-420-05					
		M4 Bolt SUS type (45mm)	FDS2-420-05					
		M6 Bolt	FD-620-10	120 ^{※2}			R30	
		M6 Bolt SUS type (90mm)	FDS-620-10					
		M6 Bolt SUS type (45mm)	FDS2-620-10					
	Plastic	FDP-320-10						

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

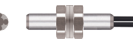







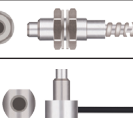
※4: • **Flexible optical fiber (Multi core)** : A large number of ultra-fine cores are all surrounded by cladding. Easy to install it in the many places as the change of the intensity of radiation by bending is small.

• **Break-resistant optical fiber** : The fiber units contain a large number of independent fine fibers, by ensuring a high degree of flexibility. It can be used for moving parts (robot hand) and it is not easily broken.

※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-3) should be used for cutting fiber cable.]


■ Specifications (Diffuse Reflective Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L)	Temp.
Coaxial type		M3 Bolt	FD-320-F	40 ^{※2}	Ø0.03	R15	2m	-40 to 70°C
		M3 Bolt	FD-320-F1	60 ^{※2}				
		M6 Bolt	FD-620-F2	120 ^{※2}				
Heat-resistant type		M6 Bolt	FD-620-10H			160 ^{※2}	R30	2m
		M6 Bolt	FD-620-15H1	R30			-40 to 150°C	
		M4 Bolt Glass type	GD-420-20H2	100 ^{※2}		R50	2m	-40 to 250°C
		M6 Bolt Glass type	GD-620-20H2					
Right angle		M6 Bolt	FDR-610-10R	120 ^{※1}	Ø0.04	R1	1m	-40 to 60°C
Side view		Ø3 Cylinder type	FDCSN-320-05	30 ^{※1}	Ø0.0125	R15	2m	

■ Specifications (convergent reflective type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L)	Temp.
Convergent reflective type		Convergent reflective type	FLF-320-10	8 ^{※1}	Ø0.0125	R25	2m	-40 to 60°C

※1: The sensing distance is a standard for BF5 Series.

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※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable.





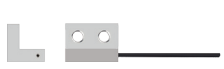









[(FC-3) should be used for cutting fiber cable.]

※ **Glass type** is for BF5R, BF4R Series.

Fiber Optic Cable

■ Specifications (Through-Beam Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L)	Temp.
Flexible type ^{※4}		Flat type /Top view	FTFU-210-05R	110 ^{※1}	Ø0.04	R1	1m Free cut	-40 to 60°C
		Flat type /Side view	FTFN-210-05R					
		Flat type /Flat view	FTF-210-05R	100 ^{※1}				
		Flat type /Top+Side view	FTFB-210-05R	110 ^{※1}				
		Integrated bracket (L type) /Top view	FTLU-310-10R	500 ^{※1}				
	FTLU1-310-10R							
	FTLU2-310-10R							
Break-resistant type ^{※4}		M3 Bolt	FT-320-05R	110 ^{※1}	Ø0.3	R5	2m Free cut	
		Ø2 Cylinder type	FTC-220-05R					
		M4 Bolt	FT-420-10R	500 ^{※1}	Ø0.5			
		M3 Bolt	FT-320-06B	110 ^{※2}	Ø0.3			
		Ø1.5 Cylinder type	FTC-1520-06B					
		M4 Bolt	FT-420-13B	400 ^{※2}	Ø0.6			
	Area type		Area type	FTW11-210-10R	750 ^{※5}			Ø0.07

※1: The sensing distance is a standard for BF5 Series.

※2: The sensing distance is a standard for red LED of BF4 Series and 10% of red LED is applied when it is green LED. It is applied to 40% of sensing distance for BF3RX.

※3: Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance ※2.

※4: ● **Flexible optical fiber (Multi core)** : A large number of ultra-fine cores are all surrounded by cladding. Easy to install it in the many places as the change of the intensity of radiation by bending is small.

● **Break-resistant type optical fiber** : The fiber units contain a large number of independent fine fibers, by ensuring a high degree of flexibility. It can be used for moving parts (robot hand) and it is not easily broken.

※5: The sensing distance is a standard for BF5 Series, and it is varied by operation mode.














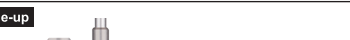
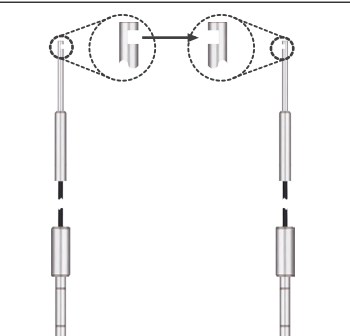
(Ultra Fast mode: 450mm / Fast mode: 750mm / Standard mode: 1400mm / Long distance mode, Ultra long distance mode: 1800mm)

※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable. [(FC-3) should be used for cutting fiber cable.]

※FT-420-13 was discontinued. FT-420-13B is replacement.

Specifications (Through-Beam Type)

(based on Non-glossy white paper)

Type	Appearance	Feature	Model	Sensing distance (mm)	Min. sensing target ^{※3}	Allowable bend radius	Cable length (L)	Temp.					
Standard type		M3 Bolt	FT-310-05	150 ^{※2}	Ø0.5	R15	1m Free cut	-40 to 70°C					
		M3 Bolt	FT-320-05	150 ^{※2}									
	Line-up 	Ø1.5 Cylinder type	FTC-1520-05										
		Ø2 Cylinder type	FTC-220-05										
		Ø2 Cylinder type SUS type (15mm)	FTCS-220-05										
		M3 Bolt SUS type (90mm)	FTS-320-05										
		M3 Bolt SUS type (35mm)	FTS1-320-05										
		M3 Bolt SUS type (45mm)	FTS2-320-05										
		M4 Bolt	FT-420-10						500 ^{※2}	Ø1	R30	2m Free cut	-40 to 105°C
		Ø3 Cylinder type	FTC-320-10										
	Plastic	FTP-320-10											
	M4 Bolt SUS type (90mm)	FTS-420-10											
	M4 Bolt SUS type (45mm)	FTS2-420-10											
Heat-resistant type		M4 Bolt	FT-420-10H	300 ^{※2}	Ø1	R30	2m	-40 to 105°C					
		M4 Bolt	FT-420-15H1	500 ^{※2}				R50	-40 to 150°C				
		M4 Bolt Glass type	GT-420-13H2	400 ^{※2}				R25	-40 to 250°C				
Right angle	Line-up 	M4 Bolt	FTR-410-10R	460 ^{※1}	Ø0.5	R1	1m Free cut						
Side view		Ø2.47 Cylinder type	FTCSN-2520-05	120 ^{※1}	Ø0.0125	R15	2m	-40 to 60°C					

※1: The sensing distance is a standard for BF5 Series.

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※ **Free cut** The sensing distance can be shortened about max. 20% than the normal according to condition of the cable.

[(FC-3) should be used for cutting fiber cable.]

※ **Glass type** is for BF5R, BF4R Series.

Fiber Optic Cable

■ Dimensions

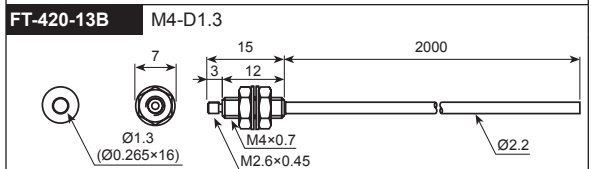
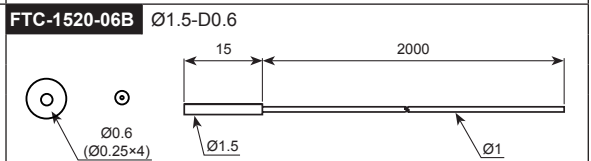
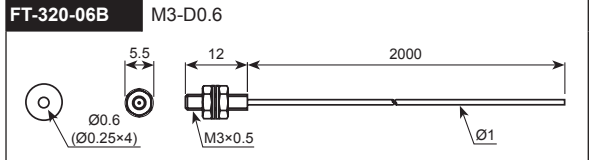
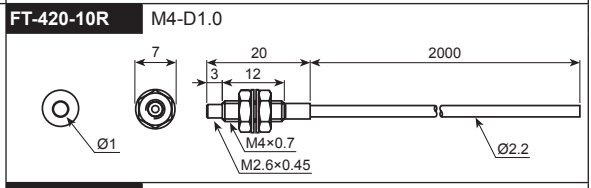
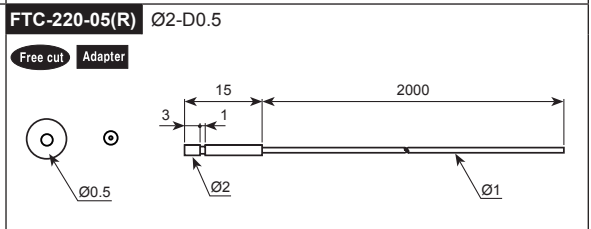
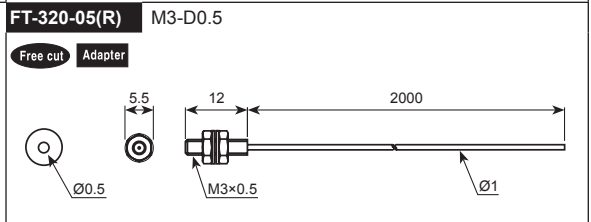
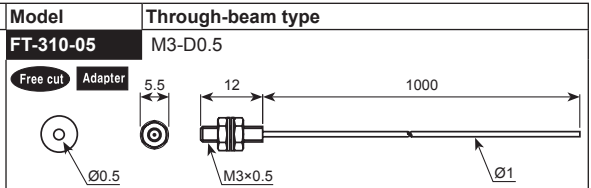
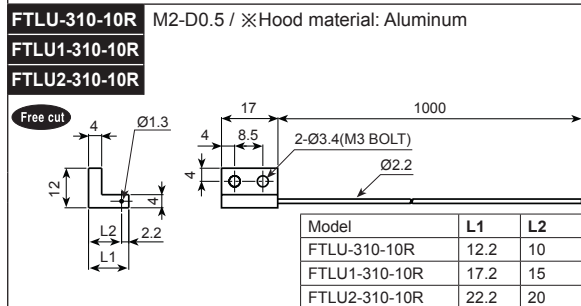
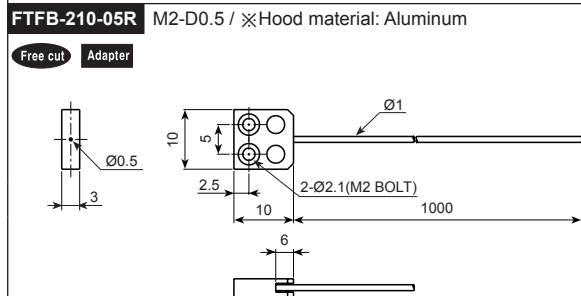
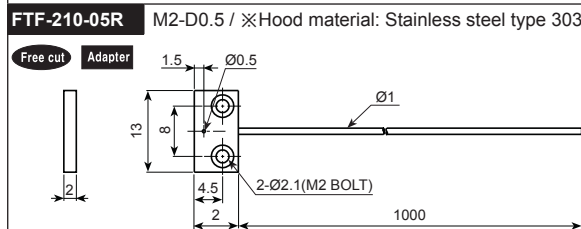
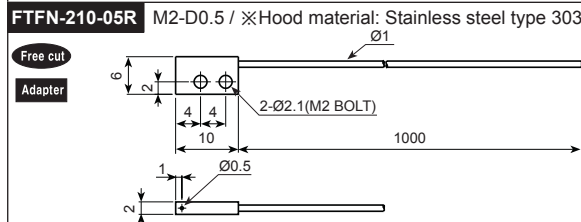
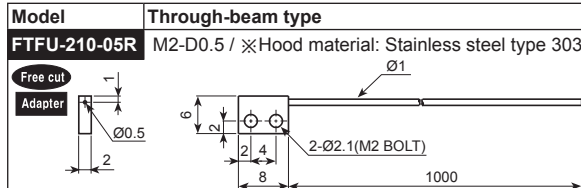
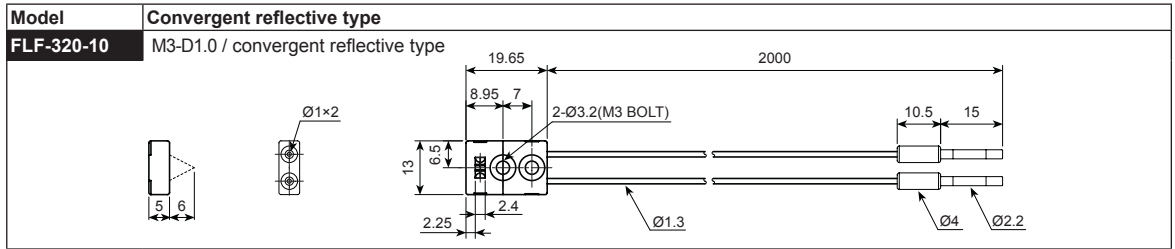
Model	Diffuse reflective type	Model	Diffuse reflective type
FDU-210-05R	M2-D0.5 / ※Hood material: Stainless steel type 303	FDC-320-06B	M3-D0.6
FDN-210-05R	M2-D0.5 / ※Hood material: Stainless steel type 303	FD-420-06B	M4-D0.6
FDF-210-05R	M2-D0.5 / ※Hood material: Stainless steel type 303	FD-620-13B	M6-D1.3
FD-310-05	M3-D0.5	FDC-320-05	Ø3-D0.5
FD-320-05(R)	M3-D0.5	FDCS-320-05	Ø3-D0.5 / SUS Ø1.5x15mm
FD-420-05(R)	M4-D0.5	FDS-320-05	M3-D0.5 / Stainless steel Ø1.5x90mm
FD-620-10(R)	M6-D1.0		

■ Dimensions

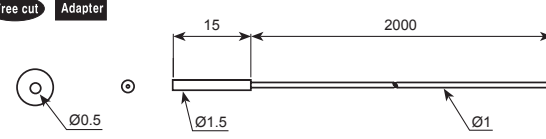
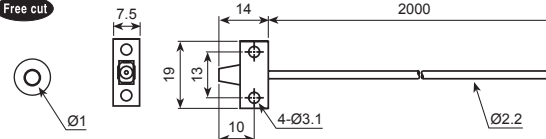
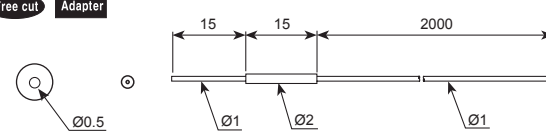
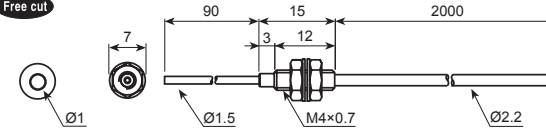
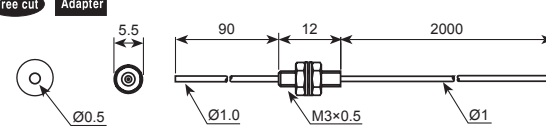
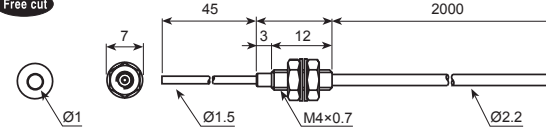
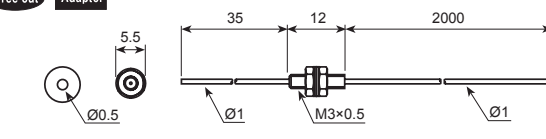
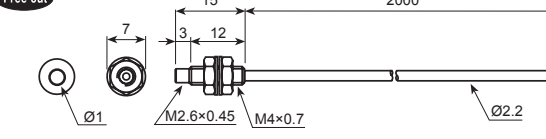
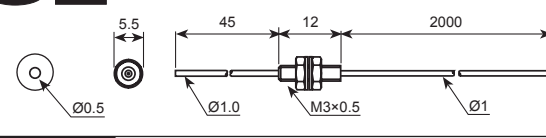
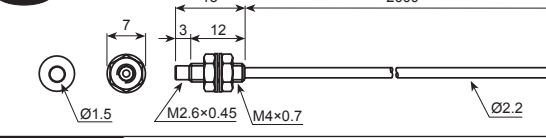
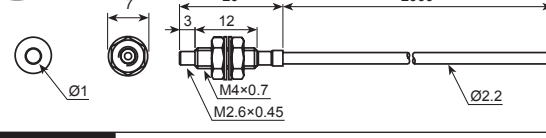
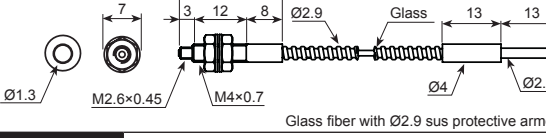
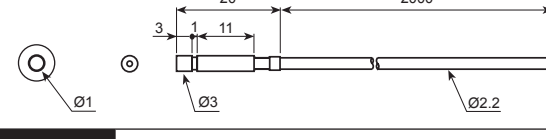
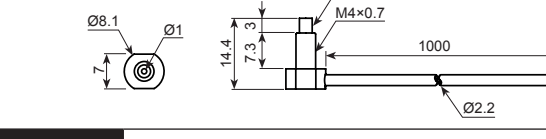
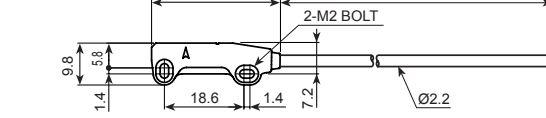
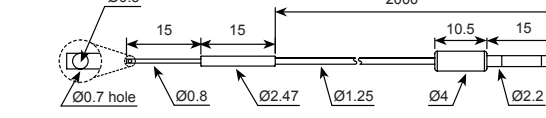
Model	Diffuse reflective type	Model	Diffuse reflective type
FD-320-06B Free cut Adapter	M3-D0.6 	FDS2-320-05 Free cut Adapter	M3-D0.5 / Stainless steel Ø1.5x45mm
FDS-420-05 Free cut Adapter	M4-D0.5 / Stainless steel Ø1.5x90mm 	FD-320-F1 Free cut Adapter	Co-axial M3 / Ø0.5, Ø0.25x9
FDS2-420-05 Free cut Adapter	M4-D0.5 / SUS Ø1.5x45mm 	FD-620-F2 Free cut	Co-axial M6 / Ø1.0, Ø0.265x16
FDS-620-10 Free cut	M6-D1.0 / SUS Ø2.5x90mm 	FD-620-10H Free cut	M6-D1.0 / Heat-resistant 105°C
FDS2-620-10 Free cut	M6-D1.0 / SUS Ø2.5x45mm 	FD-620-15H1 Free cut	M6-D1.5 / Heat-resistant 150°C
FDP-320-10 Free cut	D1.0x2 / Plastic 	GD-420-20H2 Free cut	M4-D0.05x1000 / Heat-resistant 250°C
FD-320-F Free cut Adapter	Co-axial M3 / Ø0.5, Ø0.25x4 	GD-620-20H2 Free cut	M6-D0.05x1000 / Heat-resistant 250°C
FDR-610-10R Free cut	M6-D1.0 / ※Hood material: Stainless steel type 303 	FDCSN-320-05 Free cut	Ø3 / Stainless steel Ø1.47x20 / Side view

Fiber Optic Cable

■ Dimensions



■ Dimensions

Model	Through-beam type	Model	Through-beam type
FTC-1520-05 Free cut Adapter	Ø1.5-D0.5 	FTP-320-10 Free cut	D1.0 / Plastic 
FTCS-220-05 Free cut Adapter	Ø2-D0.5 / SUS Ø1.0×15mm 	FTS-420-10 Free cut	M4-D1.0 / Stainless steel Ø1.5×90m 
FTS-320-05 Free cut Adapter	M3-D0.5 / SUS Ø1.0×90mm 	FTS2-420-10 Free cut	M4-D1.0 / Stainless steel Ø1.5×45m 
FTS1-320-05 Free cut Adapter	M3-D0.5 / SUS Ø1.0×35mm 	FT-420-10H Free cut	M4-D1.0 / Heat-resistant 105°C 
FTS2-320-05 Free cut Adapter	M3-D0.5 / SUS Ø1.0×45mm 	FT-420-15H1 Free cut	M4-D1.5 / Heat-resistant 150°C 
FT-420-10 Free cut	M4-D1.0 	GT-420-13H2 Free cut	M4-D1.3 / Heat-resistant Max. 250°C / Glass  Glass fiber with Ø2.9 sus protective armor.
FTC-320-10 Free cut	Ø3-D1.0 	FTR-410-10R Free cut	M4-D1.0 ※Hood material: Stainless steel type 303 
FTW11-210-10R Free cut	M2-D1.0 	FTCSN-2520-05 Free cut	Ø2.47-D0.5 / Stainless steel Ø0.8×15mm / Side view 

Fiber Optic Cable

■ Lens Unit For Long Distance Detection (sold separately)

◎ Model : FTL-M26



◎ Mounting of lens

Mount the lens unit on the 3mm projecting point of the front hood.

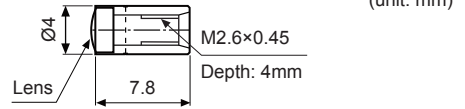
◎ Ambient temperature range of lens unit

It should be used within -40 to 100°C. (not over 100°C.)

◎ Applicable fiber optic cable and max. mounting distance

- FT-420-10 : 2500mm
- FT-420-10H : 1500mm

◎ Dimensions

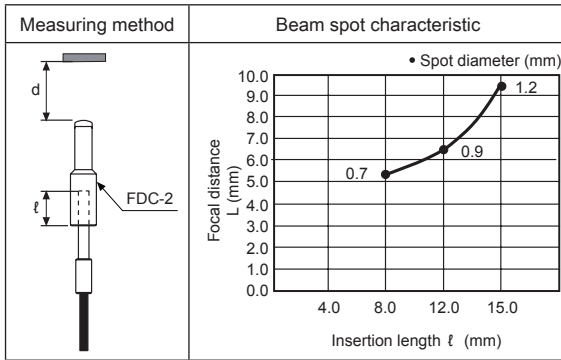


■ Micro Spot Fiber Optic Cable And Lens Unit (Sold Separately)

◎ Model

- Fiber optic cable: FDC-320-F
- Micro spot lens: FDC-2

◎ Feature data



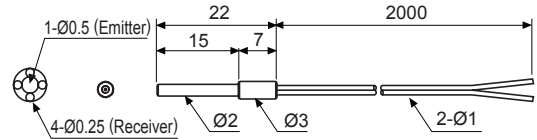
◎ Ambient temperature range of lens unit

It should be used within -40 to 100°C. (not over 100°C.)

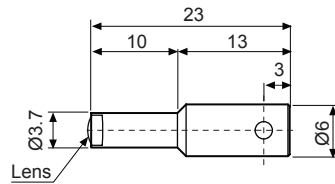
◎ Dimensions

(unit: mm)

• FDC-320-F



• FDC-2



■ Protection Tube For Fiber Optic Cable (Sold Separately)

◎ Application

: Protect cable from impact or cutting (unit: mm)

Model	Appearance and Dimension	L
FTH-305		500
FTH-310		1000
FTH-405		500
FTH-410		1000
FDH-605		500
FDH-610		1000

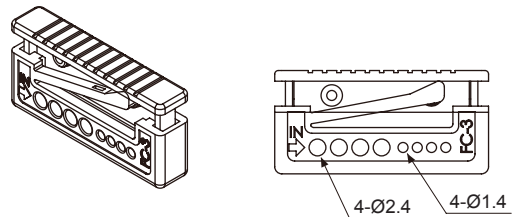
※Additional 8mm is for tube coupling.

■ Accessory

◎ Fiber cutter

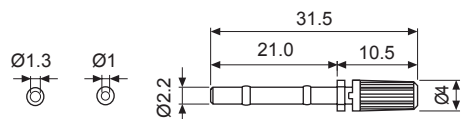
Applications: Cutting fiber optic cable, free cut type

• FC-3



◎ Adapter

Adapter: Adapter marked fiber optic cable should be used with adapter (unit: mm)



※The inside diameter Ø1 (Standard and black)

※The inside diameter Ø1.3 (Only applied to the receiver of FD-320-F1 and dark gray.)